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APPL NO.	FILING OR 371 (c) DATE	ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
10/683,670	10/10/2003	2622	1004	2003-0214	4	33	3

26652
 AT&T CORP.
 P.O. BOX 4110
 MIDDLETOWN, NJ 07748

CONFIRMATION NO. 1820

FILING RECEIPT



OC000000011687740

Date Mailed: 01/14/2004

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Domestic Priority data as claimed by applicant

Foreign Applications

If Required, Foreign Filing License Granted: 01/14/2004

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

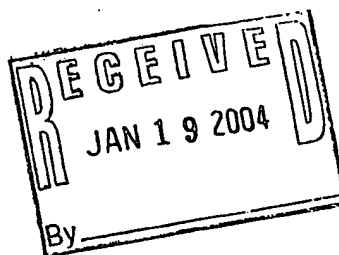
Early Publication Request: No

Title

Method and apparatus for processing facsimile transmissions

Preliminary Class

358



TITLE OF THE INVENTION

Method And Apparatus for Processing Facsimile Transmissions

BACKGROUND OF THE INVENTION

5 This invention relates generally to facsimile transmissions and more particularly to an improved method for processing facsimile transmissions in order to deal with unsolicited and unwanted facsimiles.

 Facsimile transmissions (i.e., faxes) have become an integral part of the way people communicate. Almost all businesses, and many homes, are equipped with machines capable of sending and receiving facsimile transmissions. Such machines, referred to herein generically as facsimile machines or facsimile stations, may take various forms. Stand-alone fax machines are stand-alone machines which connect to a network (usually the public switched telephone network) and contain the required functionality for sending, receiving and printing faxes. Multifunction machines are similar to stand-alone fax machines, but also have additional functionality, such as scanning, copying or acting as a computer printer. In addition, many computers contain hardware and software which allow them to act as fax machines by receiving, transmitting, displaying and printing facsimile transmissions. All of the above described facsimile machines are well known in the art, and will not be described in detail herein.

20 The popularity of facsimile machines has also presented problems. One major problem is the widespread practice of sending unsolicited facsimile transmissions (often commercial advertising) as a marketing tactic. In accordance with this practice, marketers transmit unsolicited advertising faxes to a large number of recipients, usually using the broadcast capabilities of most modern facsimile machines or computers. Recipient fax machines become tied up receiving unwanted facsimile transmissions, resulting in important faxes not getting through, wasting facsimile machine resources (e.g., paper and ink), and wasting human resources in having to deal with the unwanted facsimiles.

 One previously proposed solution to this problem, as described in U.S. Patent No. 5,293,253, is to store telephone numbers or terminal identification codes of pre-

approved facsimile machines in a memory of a facsimile machine. Upon receipt of a facsimile transmission, the fax machine first compares the telephone number or terminal identification code of the sending facsimile machine with the pre-approved numbers and codes stored in the memory of the facsimile machine. Only if the received number or code matches one of the numbers or codes stored in memory will the facsimile transmission be accepted.

However, the technique described in U.S. Patent No. 5,293,253 has not gained widespread acceptance. Unsolicited facsimile transmissions continue to be a problem, and an improved method and apparatus for dealing with this problem is needed.

BRIEF SUMMARY OF THE INVENTION

The present invention provides an improved method and apparatus for processing facsimile transmissions in order to deal with the receipt of unsolicited and unwanted faxes. In accordance with one embodiment of the invention, the service for dealing with the unsolicited facsimile problem is provided by a service provider in the telecommunications network rather than in the user premises facsimile machine. In accordance with this embodiment, upon receipt of a facsimile transmission at a network node, the received facsimile is processed at the network node based on the sending facsimile station identifier. In one embodiment, the network node looks up the sending facsimile station identifier in a database of stored facsimile station identifiers and the received facsimile is processed based on the results of the lookup. Providing this service within the service provider network provides advantages over prior solutions to the problem. End users benefit because the problem is dealt with within the network, before unwanted facsimiles even reach the end user's facsimile machine. Service providers benefit because it allows them to provide an additional valuable service to their customers. For example, in accordance with one embodiment of the invention, the service provider may store and maintain a global disapproved facsimile station identifier list for use by multiple end users. Such a list may contain station identifiers of known senders of unsolicited facsimiles.

In various embodiments, the database may store either approved facsimile station identifiers, disapproved facsimile station identifiers, or both. If approved facsimile station identifiers are stored then the facsimile is transmitted to the receiving facsimile station if the sending facsimile station identifier is found in the approved list.

5 Otherwise, the facsimile is either blocked and not transmitted to the receiving facsimile station or further processed as described below. If disapproved facsimile station identifiers are stored then the facsimile is blocked and not transmitted to the receiving facsimile station if the sending facsimile station identifier is found in the disapproved list. Otherwise, the facsimile is either transmitted to the receiving facsimile station or further
10 processed as described below.

In accordance with another embodiment of the invention, upon a sending facsimile station identifier not being found in the database, the network node may send a request for further information from the sending facsimile station prior to acceptance. If the sending facsimile station responds with appropriate information, the facsimile
15 transmission then becomes approved and is sent to the receiving facsimile station. In accordance with yet another embodiment, this aspect of requesting additional information from a sending facsimile station upon initial disapproval of the facsimile transmission may be incorporated into stand-alone facsimile machines.

These and other advantages of the invention will be apparent to those of ordinary
20 skill in the art by reference to the following detailed description and the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a network in which an embodiment of the present invention may be
25 implemented;

Fig. 2 is a flowchart showing the steps to be performed by a network node in accordance with one embodiment of the invention;

Fig. 3 shows a high level block diagram of a stand-alone facsimile station in which an embodiment of the present invention may be implemented; and

Fig. 4 is a flowchart showing the steps to be performed by a stand-alone facsimile station in accordance with one embodiment of the invention.

DETAILED DESCRIPTION

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Fig. 1 shows a network 100 in which a first embodiment of the present invention may be implemented. A sending facsimile station 102 is connected to a receiving facsimile station 112 via a well known telecommunication network. The sending facsimile station 102 is connected to an originating switch 104 which provides network connectivity to the sending facsimile station 102. In the embodiment shown in Fig. 1, the sending facsimile station 102 initiates communication with receiving facsimile station 112 by, for example, placing a telephone call to the telephone number associated with receiving facsimile station 112. Upon placing the call, originating switch 104 routes the call to terminating switch 106. Such routing may include additional network nodes which, for clarity of description, are not shown in Fig. 1. In prior art systems, upon receipt of a facsimile call, terminating switch 106 would simply send the facsimile transmission to receiving facsimile station 112.

In accordance with one embodiment of the present invention, the terminating switch 106 is configured to perform additional processing of the facsimile transmission as described in further detail below. It is noted that the description below of the processing performed by the terminating switch 106 is given principally in functional terms. One skilled in the art would readily recognize how such functionality may be added to terminating switch 106. For example, and in general terms, terminating switch 106 contains a processor for controlling the functions performed by terminating switch 106. By storing appropriate software in a memory of terminating switch 106, the processor will control the functions of the switch 106 as specified by such software.

Fig. 2 is a flowchart showing the steps to be performed by the terminating switch 106 in accordance with an embodiment of the invention. The steps of Fig. 2 are performed by terminating switch 106 upon receipt of a facsimile transmission destined for a receiving facsimile station connected to switch 106, for example receiving facsimile

station 112. First, in step 202, switch 106 looks up the identification of the receiving facsimile station 112 in DNIS trigger table 108. The DNIS (dialed number identification service) is the telephone number of the receiving facsimile station 112 and is transmitted to the terminating switch 106 by the telephone network in accordance with well known techniques. The DNIS trigger table 108 contains a list of telephone numbers associated with those receiving facsimile stations which subscribe to the facsimile processing service from the service provider. In step 204 it is determined whether the DNIS was found in DNIS trigger table 108. If not, then the receiving facsimile station does not subscribe to the facsimile processing service of the service provider and the facsimile transmission from sending facsimile station 102 is sent to the receiving facsimile station 112 in step 206. The enhanced facsimile processing steps then end.

If it is determined in step 204 that the DNIS was found in DNIS trigger table 108, then the receiving facsimile station subscribes to the facsimile processing service of the service provider and processing continues with step 208 in which a lookup of the identification of the sending facsimile station 102 is performed in database 110. In one embodiment of the invention the identifications stored in database 110 are the telephone numbers of sending facsimile stations. This embodiment utilizes the well known automatic number identification (ANI) service of the telephone network in which the telephone number of the sending station is sent along with the telephone call. In the embodiment described in accordance with Fig. 1, the ANI would be the telephone number associated with the sending facsimile station 102. It is noted that other identifiers, in addition to ANI, may be used to identify sending facsimile station 102. For example, a transmitting station identifier (TSI) is sent by sending facsimile stations for identifying the transmitting station and may be used in accordance with an alternative embodiment of the invention. While the TSI is often the telephone number of the sending facsimile machine, the TSI is configurable by a user of the sending facsimile machine. In addition, for facsimile transmissions sent over a data network, such as the Internet, the internet protocol (IP) address of the sending facsimile station may be used as the identification of the sending facsimile station.

The database 110 may take on various forms in various embodiments of the invention. For example, in one embodiment each receiving facsimile station which subscribes to the enhanced facsimile service may have its own set of data tables in database 110. Thus, each subscribing station may have an approved station list of approved facsimile station identifiers and/or a disapproved station list of disapproved facsimile station identifiers. Alternatively, the service provider itself may set up and maintain one or more such tables for use by its subscribers. For example, in one advantageous embodiment, the service provider may set up a global disapproved station list which may be used by multiple subscribers. This list would contain identifications of facsimile stations known for sending unsolicited facsimiles. In yet another alternative embodiment, the lookup performed in step 208 could look up the sending facsimile station identifier in multiple approved station lists and multiple disapproved station lists.

In step 210 the terminating switch 106 determines whether the sending facsimile station identifier was found on an approved station list. If so, then the facsimile transmission from sending facsimile station 102 is sent to the receiving facsimile station 112 in step 206. The enhanced facsimile processing steps then end. If the terminating switch 106 determines that the sending facsimile station identifier is not found on an approved station list, then processing continues with step 212 in which it is determined whether the sending facsimile station identifier was found on a disapproved station list. If so, then in step 214 the facsimile transmission from sending facsimile station 102 is blocked and is not sent to the receiving facsimile station 112. The enhanced facsimile processing steps then end. If the terminating switch 106 determines that the sending facsimile station identifier is not found on a disapproved station list, then processing continues either through the execution path shown by broken line 216, the execution path shown by broken line 218, or both. That is, upon a sending receiving station identification not being found in either an approved station list or disapproved station list, various possible steps are possible in accordance with various embodiments of the invention.

First, in accordance with execution path 216, in step 220 terminating switch 106 requests additional information from sending facsimile station 102. This requires sending facsimile station 102 to respond with additional information prior to the transmitted facsimile being transmitted to receiving facsimile station 112. In step 222 it is determined whether the sending facsimile station 102 has responded with the requested additional information within some set time period. If not, then in step 228 the facsimile transmission from sending facsimile station 102 is blocked and is not sent to the receiving facsimile station 112. If the sending facsimile station 102 has responded with the requested additional information within the time period, then the facsimile transmission from sending facsimile station 102 is sent to the receiving facsimile station 112 in step 206. The enhanced facsimile processing steps then end.

Execution path 218 identifies alternative or additional steps which may be performed when the sending facsimile station identification is not found in either an approved station list or disapproved station list. In step 224 a portion (e.g., one page) of the received facsimile is sent to the receiving facsimile station 112 for review by a user of that machine. If, as determined in step 226, the user has initiated an approval from the receiving facsimile station 112, then the remainder of the facsimile transmission from sending facsimile station 102 is sent to the receiving facsimile station 112 in step 206. The enhanced facsimile processing steps then end. If the user has not initiated an approval from the receiving facsimile station 112, then in step 228 the facsimile transmission remains blocked and the enhanced facsimile processing steps end. In accordance with one embodiment of the invention, upon receipt of approval, the network node may automatically store the sending facsimile station identifier in the approved station list.

In accordance with another embodiment of the invention, steps as described above, in which the sending facsimile station is required to send additional information prior to allowing a facsimile transmittal, may be implemented in a stand-alone facsimile station. This embodiment is described in conjunction with Figs. 3 and 4. Fig. 3 shows a stand-alone facsimile station 302 connected to a communication network 304. The facsimile station 302 is of the type well known in the art. At a high functional level, the

station 302 comprises a network interface 310 for communicating with a communication network (e.g., the public switched telephone network). The facsimile station 302 also contains a processor 306 for controlling the functioning of the facsimile station 302. The processor 306 is connected to program memory 308 which contains computer program instruction code, which, when executed by the processor 306, defines the functionality of the facsimile station 302. The processor 306 is also connected to memory 312 which contains station identifications embodied as an approved station list and/or a disapproved station list 314. One skilled in the art would recognize that Fig. 3 is a high level block diagram used only to describe the present invention, and is not meant to describe all the actual hardware elements of a stand-alone facsimile machine. For example, program memory 308 and memory 312 could be implemented as two separate physical memory devices, one shared physical memory device, or some other combination of memory devices. Of course, a typical facsimile machine would have other hardware and software for implementing its functions, all of which are well known in the art.

In accordance with an embodiment of the invention, the program code stored in program memory 308 defines steps to be performed by facsimile station 302 as shown in Fig. 4. First, in step 402 a lookup of the identification of the sending facsimile station 102 is performed in memory 312. This lookup is similar to the lookup described above in conjunction with step 208 (Fig. 2) and the identifier may be any of those as described above in connection with step 208. Next, in step 404 the facsimile station 302 determines whether the sending facsimile station identifier was found on an approved station list within memory 312. If so, then the facsimile transmission from the sending facsimile station is approved in step 414. The term "approved", as used in accordance with step 414 of Fig. 4, is used to indicate that the facsimile station 302 has determined that the received facsimile transmission may be further processed by the station 302. For example, the facsimile transmission may be printed or stored as an approved received facsimile. After approval in step 414, the enhanced facsimile processing steps then end. If the facsimile station 302 determines that the sending facsimile station identifier is not found on an approved station list, then processing continues with step

406 in which it is determined whether the sending facsimile station identifier was found on a disapproved station list in memory 312. If so, then in step 408 the facsimile transmission from sending facsimile station 102 is disapproved. The term "disapproved", as used in accordance with step 408 of Fig. 4, is used to indicate that the facsimile station 302 has determined that the received facsimile transmission should not be further processed by the station 302. For example, the facsimile transmission may be deleted or stored as a disapproved received facsimile. The enhanced facsimile processing steps then end.

If the facsimile station 302 determines in step 406 that the sending facsimile station identifier is not found on a disapproved station list, then processing continues with step 410 in which facsimile station 302 requests additional information from the sending facsimile station. This requires the sending facsimile station to respond with additional information prior to the transmitted facsimile being approved by the facsimile station 302. In step 412 it is determined whether the sending facsimile station has respond with the requested additional information within some set time period. If not, then in step 408 the facsimile transmission from the sending facsimile station is disapproved as described above. If the sending facsimile station has responded with the requested additional information within the time period, then the facsimile transmission from the sending facsimile station is approved in step 414 as described above. The enhanced facsimile processing steps then end.

As described above, and in accordance with one embodiment of the invention, users may benefit from the enhanced network facsimile processing as described herein by maintaining, in the network node, approved station lists and disapproved station lists for use by the network node in processing facsimile transmissions destined to a facsimile station associated with the user. There are various well known ways for a user to maintain such a list. In one advantageous embodiment, the user may directly maintain the list using a web interface to the database of the network node. The use of such interfaces for database maintenance as described is well known in the art. In the stand-alone embodiment described in conjunction with Figs. 3 and 4, a user may maintain the approved station lists and disapproved station lists stored in the stand-

alone facsimile station either through a user interface on the facsimile station itself, or through a computer interface if the facsimile station is connected to a computer. The use of interfaces as described above for database maintenance is well known in the art.

5 The foregoing Detailed Description is to be understood as being in every respect illustrative and exemplary, but not restrictive, and the scope of the invention disclosed herein is not to be determined from the Detailed Description, but rather from the claims as interpreted according to the full breadth permitted by the patent laws. It is to be understood that the embodiments shown and described herein are only illustrative of the principles of the present invention and that various modifications may be
10 implemented by those skilled in the art without departing from the scope and spirit of the invention. For example, various combinations of the use of approved station lists and disapproved station lists may be implemented. Thus, a receiving facsimile station may use only an approved station list and allow only facsimiles transmitted from approved stations and block all others. Alternatively, a receiving facsimile station may use only a
15 disapproved station list and block facsimiles transmitted from disapproved stations and allow all others. Those skilled in the art could implement various other feature combinations without departing from the scope and spirit of the invention.

CLAIMS

1. A method for processing a facsimile transmission sent from a sending facsimile station having an identifier to a receiving facsimile station having an identifier, said method comprising the steps of:

receiving said facsimile transmission at a telecommunication service provider network node; and

processing said facsimile transmission based on said sending facsimile station identifier.

2. The method of claim 1 further comprising the step of looking up the sending facsimile station identifier in a database of facsimile station identifiers and wherein said processing step is based on the result of said lookup.

3. The method of claim 2 wherein said database stores approved facsimile station identifiers, said method of processing further comprising the step of:

sending the complete facsimile transmission to said receiving facsimile station if said sending facsimile identifier is found in said database.

4. The method of claim 2 wherein said database stores approved facsimile station identifiers, said method of processing further comprising the step of:

sending only a portion of said facsimile transmission to said receiving facsimile station if said sending facsimile identifier is not found in said database.

5. The method of claim 4 further comprising the step of:

sending a remainder of said facsimile transmission to said receiving facsimile station upon receipt of an approval signal from said receiving facsimile station.

6. The method of claim 5 further comprising the step of:
adding said sending facsimile identifier to said database upon receipt of said approval signal.
7. The method of claim 2 wherein said database stores approved facsimile station identifiers, said method of processing further comprising the step of:
sending a request for further information to said sending facsimile station if said sending facsimile identifier is not found in said database.
8. The method of claim 7 further comprising the step of:
sending the complete facsimile transmission to said receiving facsimile station upon receipt of said further information.
9. The method of claim 2 wherein said database stores disapproved facsimile station identifiers, said method of processing further comprising the step of:
blocking said facsimile transmission to said receiving facsimile station if said sending facsimile identifier is found in said database.
10. The method of claim 2 wherein said database stores disapproved facsimile station identifiers, said method of processing further comprising the step of:
sending the complete facsimile transmission to said receiving facsimile station if said sending facsimile identifier is not found in said database.
11. The method of claim 2 wherein said telecommunication network service provider maintains a global disapproved facsimile station identifier list at said network node.
12. The method of claim 2 wherein said sending facsimile station identifier is a telephone number associated with said sending facsimile station.

13. The method of claim 2 wherein said sending facsimile station identifier is a transmitting station identifier transmitted by the sending facsimile station.

14. The method of claim 2 wherein said sending facsimile station identifier is an IP address associated with said sending facsimile station.

15. A telecommunications network node for processing a facsimile transmission sent from a sending facsimile station having an identifier to a receiving facsimile station having an identifier, said node comprising:

a network interface for receiving a facsimile transmission; and
means for processing said facsimile transmission based on said sending facsimile station identifier.

16. The telecommunications network node of claim 15 further comprising a database storing facsimile station identifiers and wherein said means for processing further comprises means for looking up said sending facsimile station identifier in said database.

17. The telecommunications network node of claim 16 wherein said database stores approved facsimile station identifiers, said node further comprising:

means for sending the complete facsimile transmission to said receiving facsimile station if said sending facsimile identifier is found in said database.

18. The telecommunications network node of claim 16 wherein said database stores approved facsimile station identifiers, said node further comprising:

means for sending only a portion of said facsimile transmission to said receiving facsimile station if said sending facsimile identifier is not found in said database.

19. The telecommunications network node of claim 18 further comprising:

means for sending a remainder of said facsimile transmission to said receiving facsimile station upon receipt of an approval signal from said receiving facsimile station.

20. The telecommunications network node of claim 19 further comprising:
means for adding said sending facsimile identifier to said database upon receipt of said approval signal.

21. The telecommunications network node of claim 16 wherein said database stores approved facsimile station identifiers, said node further comprising:
means for sending a request for further information to said sending facsimile station if said sending facsimile identifier is not found in said database.

22. The telecommunications network node of claim 21 further comprising:
means for sending the complete facsimile transmission to said receiving facsimile station upon receipt of said further information.

23. The telecommunications network node of claim 16 wherein said database stores disapproved facsimile station identifiers, said node further comprising:
means for blocking said facsimile transmission to said receiving facsimile station if said sending facsimile identifier is found in said database.

24. The telecommunications network node of claim 16 wherein said database stores disapproved facsimile station identifiers, said node further comprising:
means for sending the complete facsimile transmission to said receiving facsimile station if said sending facsimile identifier is not found in said database.

25. The telecommunications network node of claim 16 further comprising a global disapproved facsimile station identifier list maintained by said telecommunication network node.

26. The telecommunications network node of claim 16 wherein said sending facsimile station identifier is a telephone number associated with said sending facsimile station.

27. The telecommunications network node of claim 16 wherein said sending facsimile station identifier is a transmitting station identifier transmitted by the sending facsimile station.

28. The telecommunications network node of claim 16 wherein said sending facsimile station identifier is an IP address associated with said sending facsimile station.

29. A facsimile station comprising:
a network interface for receiving a facsimile transmission from a sending facsimile station;
a memory for storing a list of approved facsimile station identifiers;
means for looking up a sending facsimile station identifier in said list of approved facsimile station identifiers; and
means for requesting further information from said sending facsimile station if said sending facsimile station identifier is not found in said list of approved facsimile station identifiers; and
means for approving said facsimile transmission upon receipt of said further information from said sending facsimile station.

30. The facsimile station of claim 29 wherein said sending facsimile station identifier is the telephone number associated with said sending facsimile station.

31. The facsimile station of claim 29 wherein said sending facsimile station identifier is the transmitting station identifier transmitted by the sending facsimile station.

32. The facsimile station of claim 29 wherein said sending facsimile station identifier is an IP address associated with said sending facsimile station.

33. The facsimile station of claim 29 further comprising:
means for adding said sending facsimile station identifier to said list of approved facsimile station identifiers upon receipt of said further information from said sending facsimile station.

ABSTRACT OF THE DISCLOSURE

A system and method for enhanced processing of a facsimile transmission is disclosed. A terminating telecommunications switch receives a facsimile communication from a sending facsimile station and determines whether a receiving facsimile station subscribes to an enhanced facsimile processing service. If so, then the network node determines, based on an identification of the sending facsimile station, whether the received facsimile will be approved for transmission to the receiving facsimile station. In various embodiments, additional information from the sending facsimile station, or approval from the end user, may be required prior to approving the facsimile transmission. Also disclosed is a stand-alone facsimile station which implements enhanced facsimile processing by requiring additional information from a sending facsimile station prior to approving the facsimile transmission.

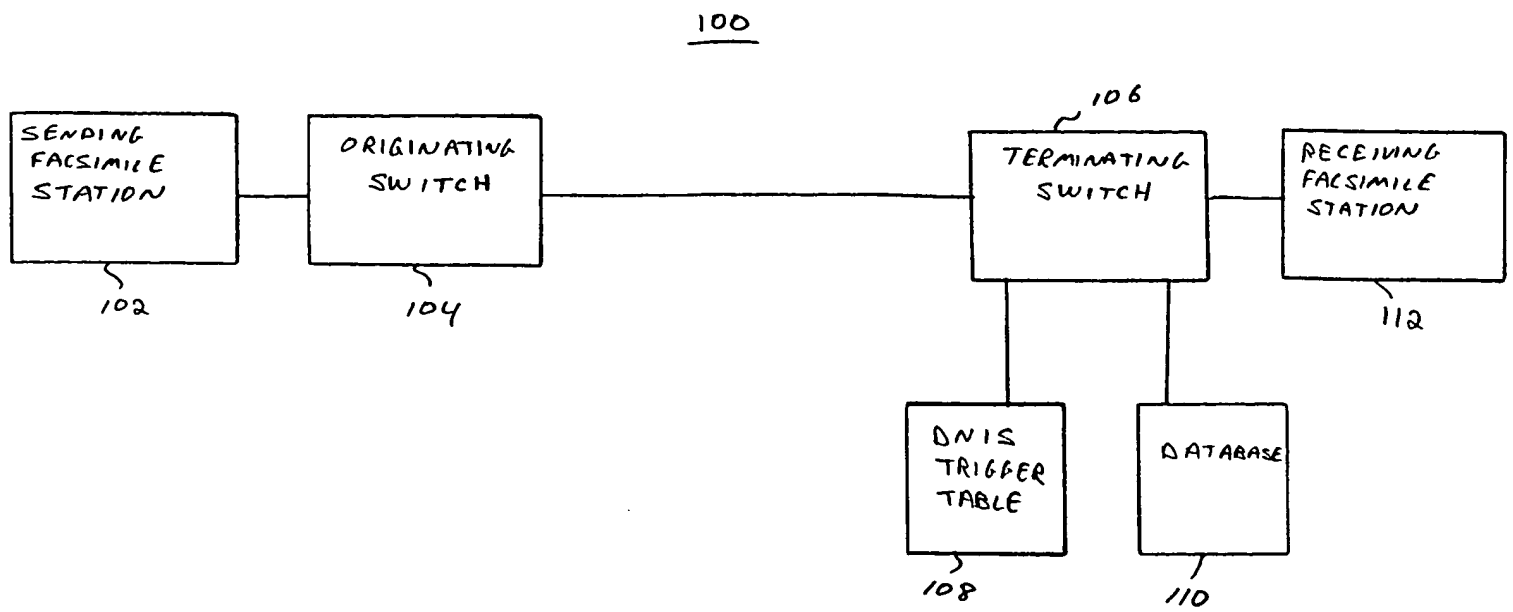


FIG. 1

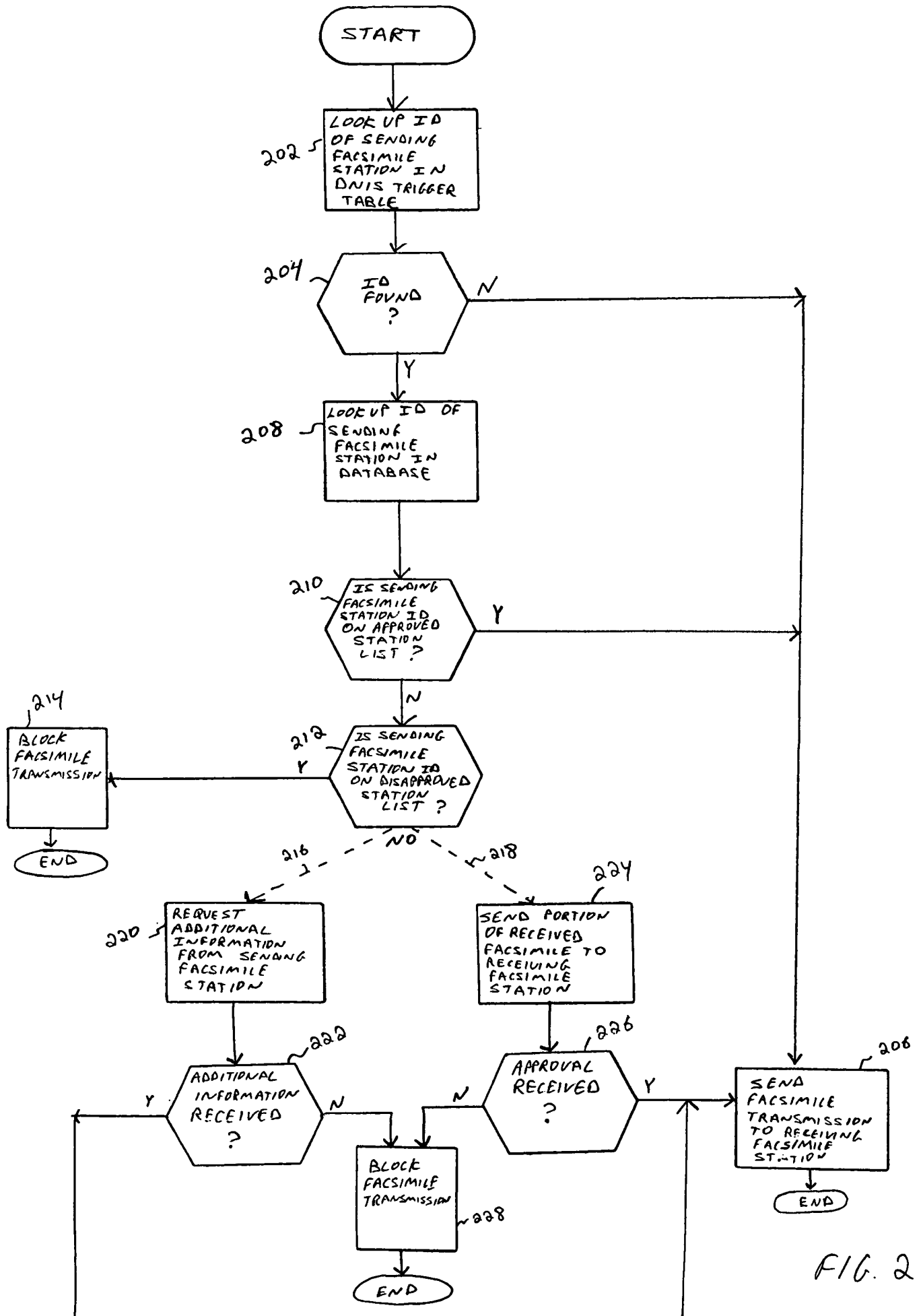


FIG. 2

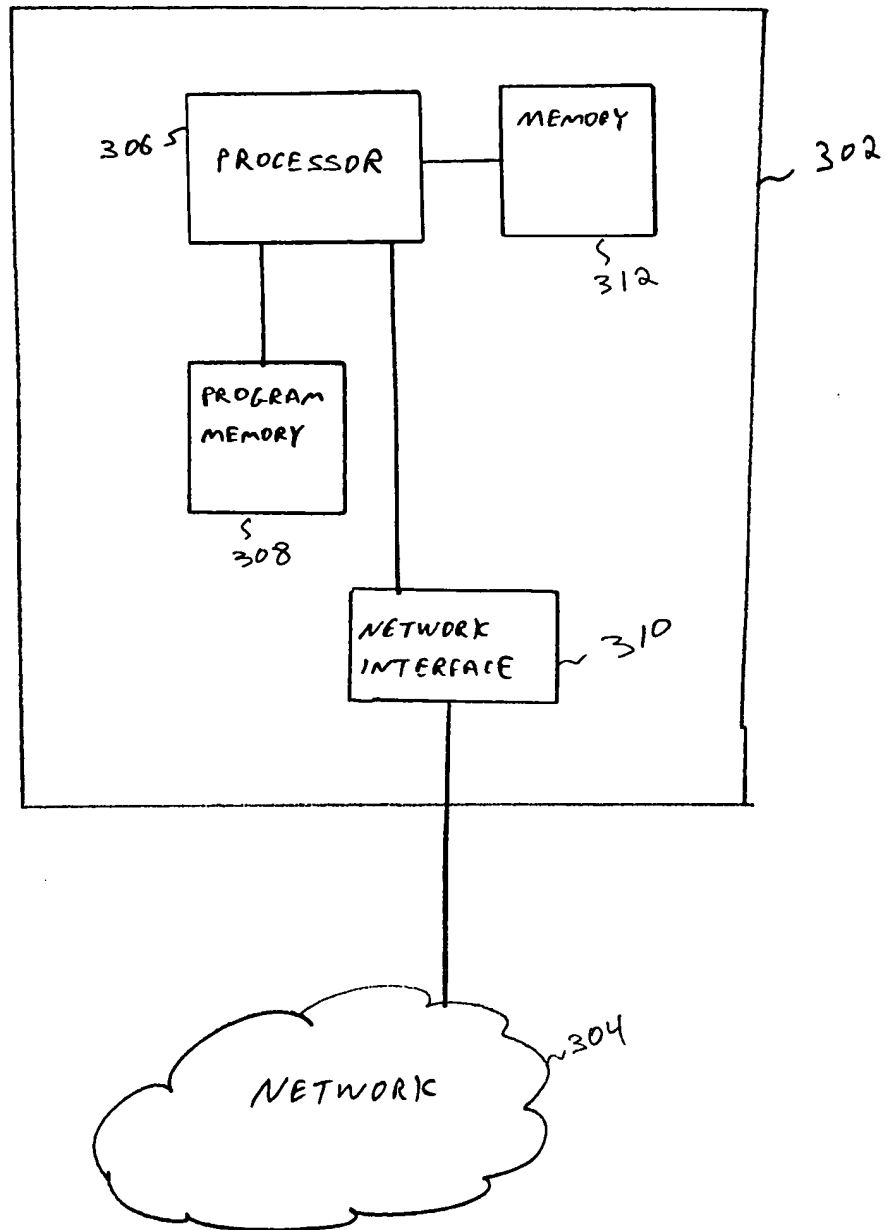


FIG. 3

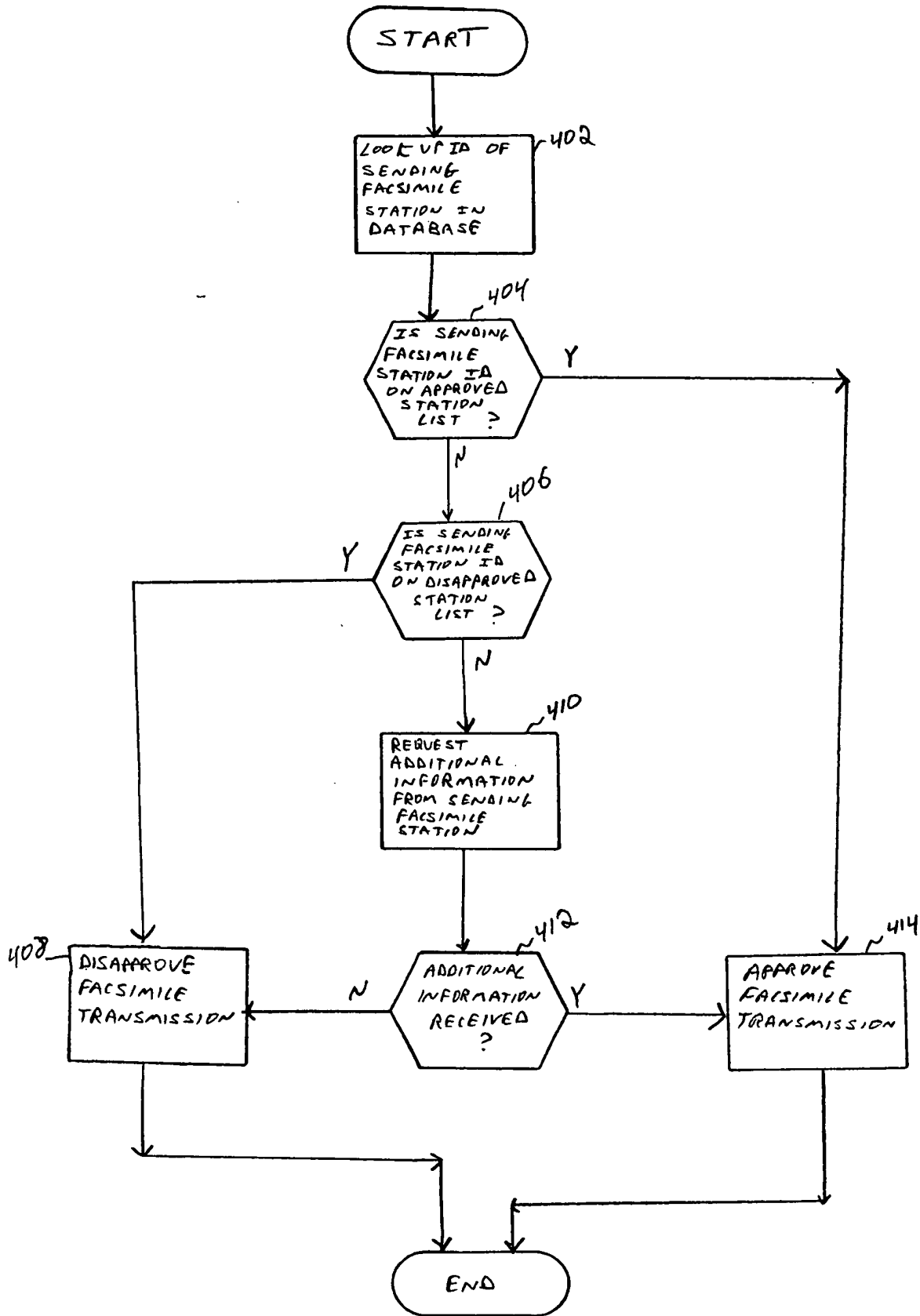


FIG. 4